Preliminary
TECHNICAL DATASHEET #TDAX100520

2x Universal Inputs, 1x 10A H-Bridge Controller

1x CAN (SAE J1939) Port
2x Universal Inputs (Voltage, Current, Frequency, PWM, Digital)
1x Full H-Bridge or 1x Proportional Output
Configurable with the Axiomatic Electronic Assistant

P/N: AX100520

Features

- 2x universal signal inputs selectable as follows.
  - Voltage
  - Current
  - Frequency
  - PWM
  - Digital
- 1x output (up to 10 A) selectable as follows.
  - H-bridge output (Current or PWM)
  - Proportional voltage
  - Proportional current
  - Digital hotshot
  - PWM
  - Digital
  - Disabled

- 1x CAN port (SAE J1939) with auto-baud-rate detection
- Operating voltage range from 8 to 80 VDC (12, 24, or 48 VDC nominal)
- Reverse polarity, surge and transient, undervoltage, and overvoltage protection
- 1x 8-pin TE AMPSEAL connector
- IP67-rated cast metal enclosure
- Configurable with the Axiomatic Electronic Assistant

Applications

Control systems for actuators, valves, and DC motors in off-highway and agricultural (Ag) equipment

Ordering Part Number

2x Universal Inputs, 1x 10A H-Bridge Controller, CAN (SAE J1939) with Auto-Baud-Rate Detection - P/N: **AX100520**

Accessories:
Axiomatic Electronic Assistant Configuration KIT - P/N: **AX070502** or **AX070506K**

Description

The AX100520 controller can measure two universal signal inputs. It can provide one full H-bridge or one proportional output (up to 10 A). Flexible circuit design gives the user a wide range of configurable input and output types. Powerful control algorithms allow the user to program the controller for a wide range of applications without the need for custom firmware. It features auto-baud-rate detection.

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Block Diagram

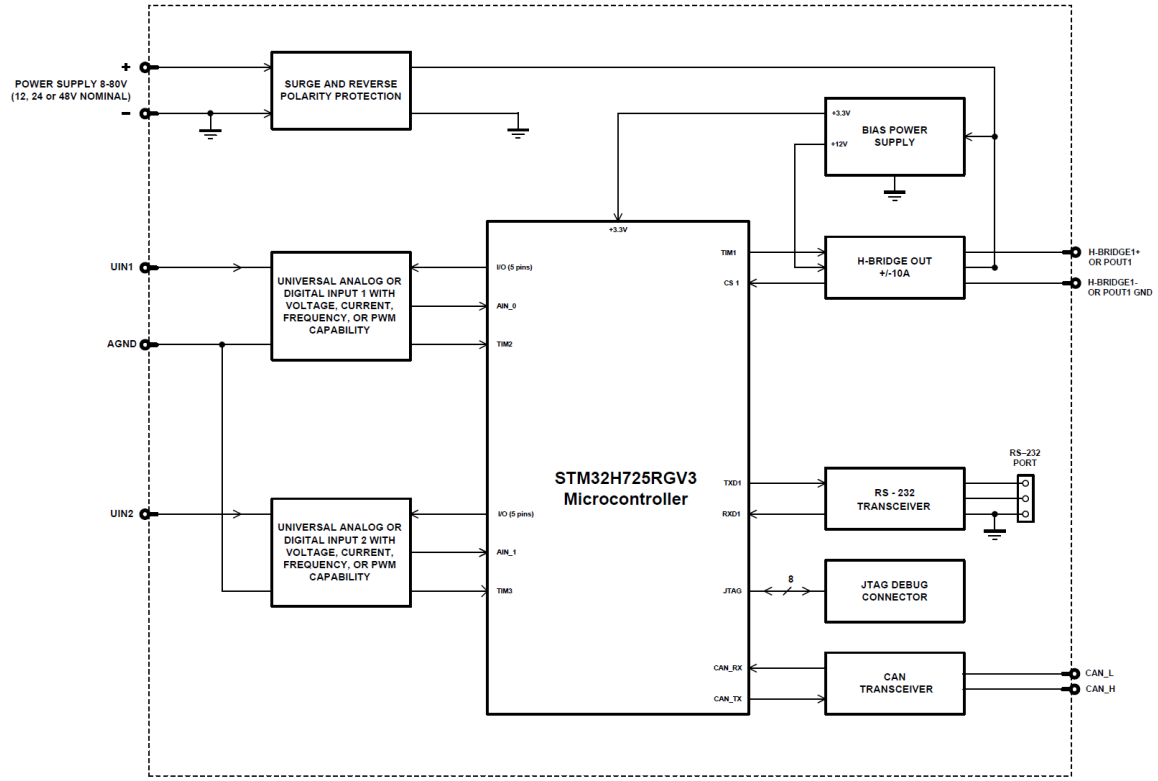

Figure 1. Hardware Block Diagram

Dimensional Drawing

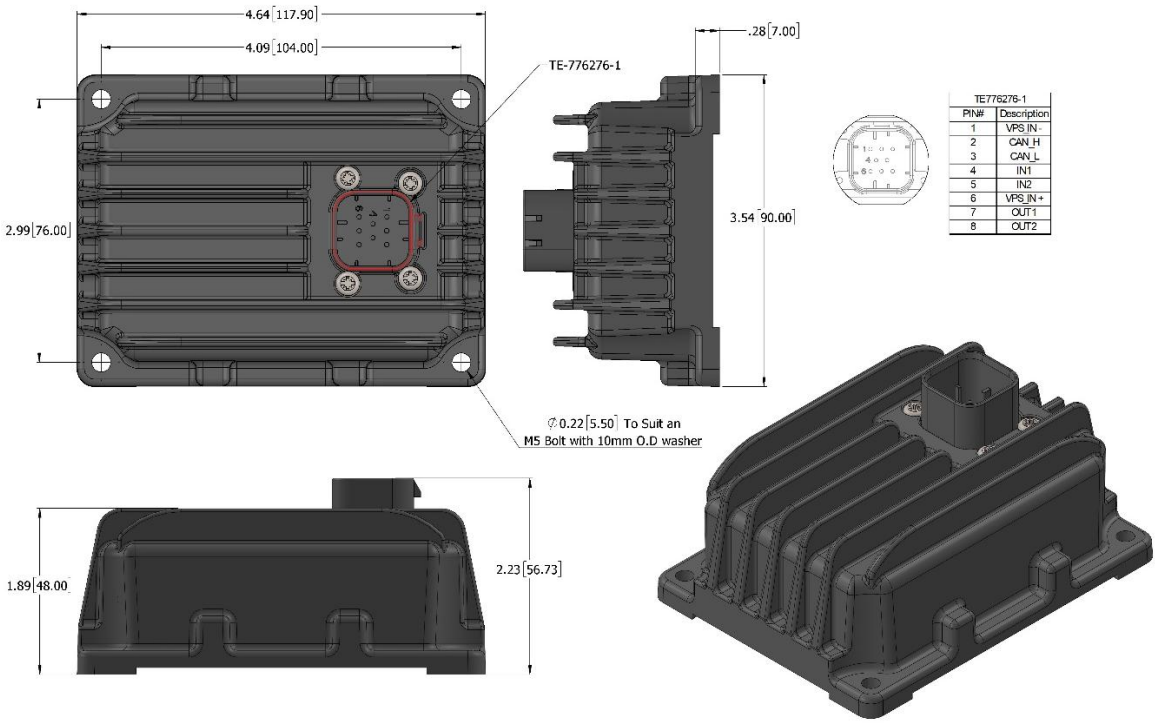

Figure 2. Dimensional Diagram

Technical Specifications

Specifications are indicative and subject to change. Actual performance will vary depending on the application and operating conditions. Users should satisfy themselves that the product is suitable for use in the intended application. All our products carry a limited warranty against defects in material and workmanship. Please refer to our Warranty, Application Limitations & Return Materials Process as described on https://www.axiomatic.com/service/.

Power Input

Power Input	12, 24, or 48 VDC nominal 8 to 80 VDC range
Quiescent Current	52.6 mA @ 12 VDC; 42 mA @ 24 VDC; 30 mA @ 48 VDC typical
Protections	Surge protection is provided. Reverse polarity protection is provided. Under-voltage protection is provided. (Hardware shutdown at 6 V) Over-voltage protection is provided. (Hardware shutdown at 86 V)

Inputs

Inputs	2x universal inputs selectable as voltage, current, frequency, PWM, or digital types

Voltage	Range: 0 to 5 V, 0 to 10 V Resolution: 1 mV Accuracy: ±1 % error
Current	Range: 0 to 20 mA, 4 to 20 mA Resolution: 1 µA Accuracy: ±1 % error
Frequency	Frequency: 0 to 10,000 Hz Resolution: 0.01 % Accuracy: ±1 % error
PWM	Frequency: 0 to 10,000 Hz Duty Cycle: 0 to 100 % Resolution: 0.01 % Accuracy: ±1 % error
Digital	1 MΩ impedance; or Active High with 10 kΩ pull-up; or Active Low with 10 kΩ pull-down resistor to Ground Amplitude: Up to 36 V

12-bit analog to digital resolution

Protection	Protected against short circuit to Ground

Output

Output: 1x output (up to 10 A sourcing or up to -10 A sinking) programmable either as:

- **1x full H-bridge output** (Current or PWM)
- 1x proportional output

The proportional output is further configurable as follows.

Proportional Voltage	Range: 0 to Vps (up to 48 V) Resolution: 10 mV Accuracy: ± 5 % error
Proportional Current	Ranges: 0 to 10 A Resolution: 10 mA Accuracy: ±1 % error
Hotshot Digital	See profile diagram below.
PWM	Range: 1 Hz to 10 kHz Duty Cycle: 0 to 100 % Resolution: 0.01% Accuracy: ±1 % error
Digital	On/Off
Disabled	-

Current sensing is provided.
The total load at power supply voltage must not exceed more than 32 A.

Note: The load is connected between two output pins “Output 1” and “Output 2”.

Protection	Overcurrent protection against shorts to Ground or +Vsupply at 23 A per output

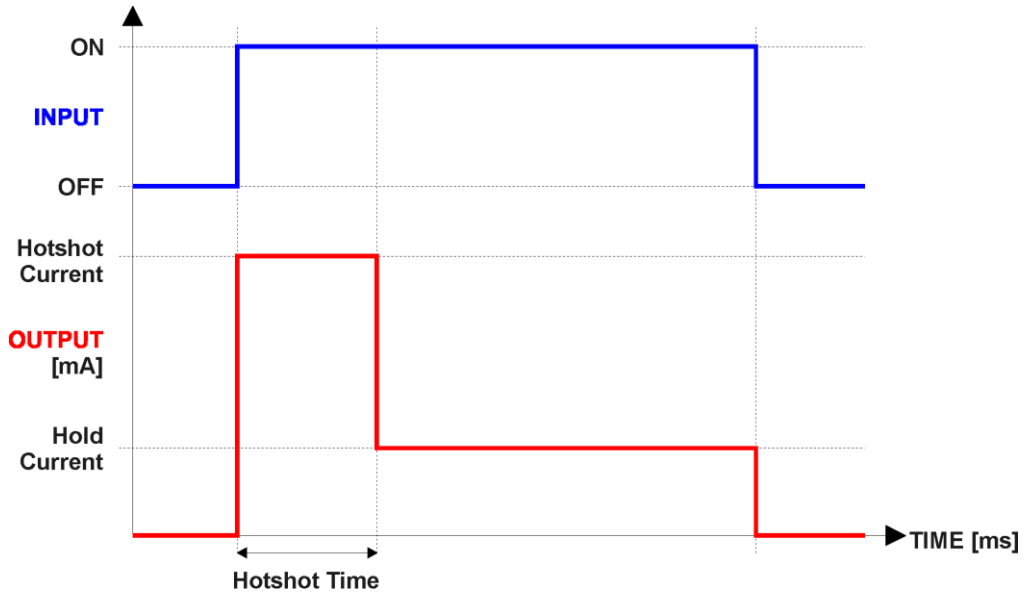

Figure 3. Hotshot Digital Profile

General Specifications

Microcontroller	STM32H725RGV3 32-bit, 1 MB flash memory
Control Logic	Standard embedded control logic is provided. Refer to the User Manual.
Communications	1x CAN port (SAE J1939) Supported baud-rates: 125 kbit/s, 250 kbit/s, 500 kbit/s, or 1 Mbit/s with auto-baud-rate detection
Network Termination	It is necessary to terminate the network with external termination resistors. The resistors are 120 Ω, 0.25 W minimum, metal film or similar type. They should be placed between CAN High and CAN Low terminals at both ends of the network.
User Interface	Axiomatic Electronic Assistant KIT - P/Ns: **AX070502** or **AX070506K**
Compliance	RoHS
Protection Rating	IP67 (IEC 60529 compliant when mating connectors compliant with IEC 61076-2-101:2012 are installed.)
Operating Conditions	-40 to 85 °C (-40 to 185 °F)
Storage Temperature	-50 to 125 °C (-58 to 257 °F)
Weight	1.144 lb. (0.519 kg)
Enclosure	Cast Aluminum enclosure, anodized 4.64 in. x 3.54 in. x 2.23 in. (117.90 mm x 90.00 mm x 56.73 mm) L x W x H includes the integral connector Refer to Dimensional Drawing.
Electrical Connections	8-pin TE AMPSEAL connector - P/N: 776276-1
Mounting	Mounting holes are sized for #10 or M5 bolts. Use 10 mm (O.D.) washers with the bolts. The bolt length will be determined by the end-user's mounting plate thickness. The mounting flange of the controller is 0.28 in. (7 mm) thick. It should be mounted with connectors facing left or right to reduce the likelihood of moisture entry. All field wiring should be suitable for the operating temperature range. Install the unit with appropriate space available for servicing and for adequate wire harness access (6 in. or 15 cm) and strain relief (12 in. or 30 cm).

Pin	Description
1	Power Input -
2	CAN High
3	CAN Low
4	Input 1
5	Input 2
6	Power Input +
7	Output 1
8	Output 2

Form: TDAX100520-11/28/2025